

REMARKS

The Examiner indicated that claims 10, 12-17, 20-23, 25, 27-29 and 33-35 are allowed.

Applicants gratefully acknowledge the Examiner's indication of allowable subject matter.

The Examiner rejected claim 11 under 35 U.S.C. §103(a) as allegedly being unpatentable over Hoffman et al. (US PAT 5,578,869, Hoffman) in view of Crane et al. (USPAT 4,888,449, Crane).

The Examiner rejected claim 36 under 35 U.S.C. §103(a) as allegedly being unpatentable over Hoffman, Crane and Kozono (USPAT 5,619,070).

Applicants respectfully traverse the §103(a) rejections.

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35 U.S.C. §103(a): Claim 11

The Examiner rejected claim 11 under 35 U.S.C. §103(a) as allegedly being unpatentable over Hoffman et al. (US PAT 5,578,869, Hoffman) in view of Crane et al. (USPAT 4,888,449, Crane).

Applicants respectfully contend that claim 11 is not unpatentable over Hoffman in view of Crane, because Hoffman in view of Crane does not teach or suggest each and every feature of claim 11. For example, Hoffman in view of Crane does not teach or suggest: "wherein forming the mineral layer includes forming the mineral layer having a mineral selected from the group consisting of silicon dioxide, silicon nitride, and silicon carbide".

The Examiner argues: "Hoffman discloses in column 4, lines 40 - 56 wherein forming the mineral layer includes forming the mineral layer having a mineral selected from the group consisting of silicon carbide (the only carbide mentioned in Hoffman is a silicon carbide see column 4, lines 41 and 55 - 56)." In Response to Arguments, the Examiner further argues: "With regard to applicant's argument that "Hoffman does not disclose that the nonconductive layer 24 may include silicon carbide," it should be noted that the only carbide mentioned in Hoffman is silicon carbide (see column 4, lines 41 and 55 - 56). Hoffman's mention of "carbido" in column 4, lines 55 - 56 must include "silicon carbide" because "silicon carbide" is the only carbide mentioned by Hoffman in the entire disclosure."

In response to the preceding arguments by the Examiner, Applicants note that Hoffman, col. 4, line 40-42 discloses silicon carbide as a possible material for the substrate 22. In col. 4, lines 55-56, Hoffman discloses that the non-conductive layer 24 (which the Examiner alleges is a mineral layer) maybe a "carbido layer". Applicants maintain that Hoffman's disclosure that the

substrate 22 may include silicon carbide does not imply a disclosure by Hoffman that the carbide layer 24 may include silicon carbide. Applicants maintain that the Examiner has not supplied any persuasive analysis or other evidence to support the Examiner's assertion that Hoffman's disclosure that the substrate 22 may include silicon carbide implies a disclosure by Hoffman that the carbide layer 24 may include silicon carbide.

Furthermore, Applicants respectfully contend that it is not obvious "to use the adhesion promoter layer of Crane in the method of Hoffman in order to improve adhesion of the inorganic mineral layer to the adhesion layer as stated column 7, lines 51 - 59 of Crane" as argued by the Examiner. Applicants contend, however, that there is no need at all to form an adhesion promoter on the mineral layer 24 of Hoffman, since the only layer in Hoffman that the mineral layer 24 is bonded to in FIG. 2 is the conductive circuit trace 26. It is not obvious to form an adhesion promoter on the mineral layer 24, because Hoffman discloses in col. 4, line 67 - col. 5, line 7: "While the first plurality of conductive circuit traces 26 may be formed on the first surface 28 by any desired means, including lamination or adhesive bonding, it is preferred that the circuit traces 26 be in direct contact with the non-conductive layer 24 and be formed by a process such as chemical vapor deposition, physical vapor deposition, electroless plating or electrolytic plating" (emphasis added).

In addition, the conductive circuit traces 26 is likely to be made of copper as is known in the art, and the silane and titanate adhesion promoters disclosed in col. 7, lines 51 - 52 of Crane do not work with copper as indicated in Crane, col. 7, line 53.

Based on the preceding arguments, Applicants respectfully maintain that claim 11 is not unpatentable over Hoffman in view of Crane, and that claim 11 is in condition for allowance.

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35 U.S.C. §103(a): Claim 36

The Examiner rejected claim 36 under 35 U.S.C. §103(a) as allegedly being unpatentable over Hoffman, Crane and Kozono (USPAT 5,619,070).

Applicants respectfully contend that claim 36 is not unpatentable over Hoffman, Crane and Kozono, because it is not obvious "to use the adhesion promoter layer of Crane in the method of Hoffman in order to improve adhesion of the inorganic mineral layer to the adhesion layer as stated column 7, lines 51 - 59 of Crane" as argued by the Examiner. Applicants contend, however, that there is no need at all to form an adhesion promoter on the non-conductive layer 24 of Hoffman, since the only layer in Hoffman that the non-conductive layer 24 is bonded to in FIG. 2 or FIG. 3 is the conductive circuit trace 26. It is not obvious to form an adhesion promoter on the non-conductive layer 24, because Hoffman discloses in col. 4, line 67 - col. 5, line 7: "While the first plurality of conductive circuit traces 26 may be formed on the first surface 28 by any desired means, including lamination or adhesive bonding, it is preferred that the circuit traces 26 be in direct contact with the non-conductive layer 24 and be formed by a process such as chemical vapor deposition, physical vapor deposition, electroless plating or electrolytic plating" (emphasis added).

In addition, the conductive circuit traces 26 is likely to be made of copper as is known in the art, and the silane and titanate adhesion promoters disclosed in col. 7, lines 51 - 52 of Crane do not work with copper as indicated in Crane col. 7, line 53.

Applicants further contend that claim 36 is not unpatentable over Hoffman, Crane and Kozono, because Hoffman, Crane and Kozono do not teach or suggest: "coupling the metallic

plate to the semiconductor chip by interfacing the adhesive material between the adhesion promoter layer and the semiconductor chip".

The Examiner argues: "Hoffman discloses in figure 3 providing a semiconductor chip (10). Hoffman discloses in figure 3 and column 6, lines 3 - 6 providing an adhesive material (54).... Hoffman and Crane do not teach coupling the metallic plat to the semiconductor chip by interfacing the adhesive material between the adhesion promoter layer and the semiconductor chip. Kozono discloses in figures 2a and 2b coupling a metallic plate (13) to an semiconductor chip (11) by interfacing an adhesive material (12) between the metallic plate and the semiconductor chip. It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the adhesive material between the metallic plate and the semiconductor chip of Kozono in the method of Hoffman and Crane in order to protect the semiconductor chip from foreign particles that cause shorts. It would have been further obvious in the method of Hoffman, Crane, and Kozono that the adhesive material would be between the adhesion promoter layer and the semiconductor chip."

In response, Applicants respectfully contend that the Examiner has not supplied a legally persuasive argument as to why a person of ordinary skill in the art would modify Hoffman by the teaching of Kozono in relation to claim 36. In particular, established case law requires that the prior art must contain some suggestion or incentive that would have motivated a person of ordinary skill in the art to modify a reference or to combine references. See Karsten Mfg. Corp. v. Cleveland Gulf Co., 242 F.3d 1376, 58 U.S.P.Q.2d 1286, 1293 (Fed. Cir. 2001) ("In holding an invention obvious in view of a combination of references, there must be some suggestion, motivation, or teaching in the prior art that would have led a person of ordinary skill in the art to

select the references and combine them in a way that would produce the claimed invention.”).

See also *In re Gordon*, 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984) (“The mere fact that the prior art could be so modified would not have made the motivation obvious unless the prior art suggested the desirability of the modification.”).

Accordingly, Appellant maintains that the Examiner has not made any showing of where the prior art suggests incorporation of adhesive into Hoffman’s structure “to protect the semiconductor chip from foreign particles that cause shorts”. Hoffman does not indicate any vulnerability for said alleged shorting to occur. In fact, the non-conductive layer 24 already protects the semiconductor chip 10 in FIG. 3 of Hoffman from shorting to the metallic plate 22. The space between the semiconductor chip 10 and the non-conductive layer 24 additionally protects the semiconductor chip 10 from shorting to the metallic plate 22. Applicants respectfully maintain that the Examiner’s reason for the use of the adhesive of the Examiner is the suggestion of the Examiner alone and is not suggested in the prior art as required by law. To add the adhesive to Hoffman’s invention would add unnecessary expense and fabrication time, as well as unnecessary complexity which could result in a lower yield.

Based on the preceding arguments, Applicants respectfully maintain that claim 36 is not unpatentable over Hoffman, Crane and Kozono, and that claim 36 is in condition for allowance.

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CONCLUSION

Based on the preceding arguments, Applicants respectfully believe that all pending claims and the entire application meet the acceptance criteria for allowance and therefore request favorable action. If the Examiner believes that anything further would be helpful to place the application in better condition for allowance, Applicants invites the Examiner to contact Applicants' representative at the telephone number listed below.

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